Climate Services for Agriculture: Empowering Farmers to Manage Risk and Adapt to a Changing Climate in Rwanda

Quarterly Progress Report
January - March 2019

Executive Summary

Progress towards ***Outcome 1: Climate Services for Farmers*** included training and implementation of Participatory Integrated Climate Services for Agriculture (PICSA), Radio Listener Clubs, and community discussions around the March-May seasonal forecast. Training 211 intermediaries from the three districts of Kigali (28 January to 15 February) marked the milestone of implementing the PICSA through *Twigire Muhinzi* across all 30 districts. Project activities strengthened the delivery of climate services through radio, and the integration of radio and *Twigire Muhinzi* channels via Radio Listener Clubs. RAB, Meteo-Rwanda, Radio Huguka, the Nkunganire Program, PASP, 13 district agronomists and Radio Listener Clubs participated in 20 talk shows. Sixteen episodes of the "*Urubuto Ntera*" radio magazine program were produced and broadcast nationally by Radio Huguka. The project organized a one-day workshop with Meteo-Rwanda and RAB to communicate the March-May seasonal forecasts with project partners (Caritas Butare, Caritas Kibungo, Caritas Kibuye and DERN) and 16 PASP cooperatives representatives from Gatsibo, Ngoma, Nyanza and Rubavu districts.

Outcome 2: Climate Services for Government and Institutions was advanced, in collaboration with the WISER-Rwanda project, through a Climate Maproom training workshop for District Agronomists (14-15 March), and input into the design of a Summary Maproom for local government. To expand the scope of climate-based farmer advisories, the project purchased a soil nutrient scanner that will rapidly test farmers' soils, and transmit fertility management recommendations to farmer's cell phones.

Advances toward ***Outcome 3: Climate Information Provision*** included further refinement of Meteo-Rwanda Maproom graphs formatted for PICSA activities; prototyping and discussion of a Sector-based "Summary" Maproom for local governments to visualize local conditions, and updating the seasonal forecast maproom to include the September-December 2018 season. Preparations began for a training visit of Meteo-Rwanda staff to IRI.

Advances in ***Outcome 4: Climate Services Governance*** involve collaboration with the WISER-Rwanda project, including: contributing to the development and testing of an ICT-based tool to efficiently capture user's feedback and contribute to co-production; and leveraging an Impact-Based Early Warning Service (IBEWS) workshop to re-convene many of the stakeholders who were involved in the Rwanda National Framework for Climate Services (NFCS) inception workshop, and raise awareness of subsequent progress.

Support for AIMS interns concluded with submission of reports and draft publications. With support from the CIAT-led De-Risk project in Southeast Asia, Gloriose Nsengiyumva (Outcome 1 Coordinator) spent a month in Vietnam to share the project's approach, provide training in the PICSA methodology, and exchange experience and lessons between regions.

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Acronyms

AIMS	African Institute for Mathematical Sciences
CCAFS	CGIAR Research Program on Climate Change, Agriculture and Food Security
CIAT	International Center for Tropical Agriculture (Spanish acronym)
DERN	Development Rural du Nord
FFS	Farmer Field School Facilitators
FP	Farmer Promoter
IFAD	International Fund for Agricultural Development
IKI	International Climate Initiative (German acronym)
ILRI	International Livestock Research Institute
IRI	International Research Institute for Climate and Society
JADF	Joint Action Development Forum
MINAGRI	Ministry of Agriculture and Animal Resources
NCFS	National Framework for Climate Services
PICSA	Participatory Integrated Climate Services in Agriculture
PASP	Post-Harvest and Agribusiness Support Project
RAB	Rwanda Agriculture Board
RCSA	Rwanda Climate Services for Agriculture

Progress during the Reporting Period (January-March 2019)

Training of intermediaries from the three districts of Kigali marked the milestone of implementing climate services for farmers into all 30 of Rwanda's districts, through the *Twigire Muhinzi* agricultural extension system and the PICSA process. Project activities strengthened the delivery of climate services through radio, and the integration of radio and *Twigire Muhinzi* channels via Radio Listener Clubs. The 2019 Season B (March-May) seasonal forecast was delivered to implementation partners and PASP cooperative representatives, to share with their networks of farmers.

Collaborative activities with the WISER-Rwanda project trained and deepened engagement with district agricultural professionals, and elicited their input into the design of a Summary Maproom to support local government – to be implemented over the coming two quarters. This training also introduced an ICT-based "5Q" tool, which uses a sequence of 5 simple yes/no or multiple-choice questions, within a decision tree structure, to capture and record feedback from farmers or other stakeholders. The 5Q tool, with its simple mobile phone interface and automated process, is a step towards overcoming the practical challenge of efficiently bringing diverse users' voice into the co-production of climate services at a national scale.

Another highlight was the purchase of a soil nutrient scanner, linked to a mobile phone advisory platform to help inform farmers about the nutrients in their soil. The soil information will be recorded and transmitted to farmer's cell phones to help them make better-informed decisions.

Outcome 1: Climate Services for Farmers

Participatory Integrated Climate Services (PICSA) training

PICSA trainings were conducted for intermediaries that included Farmer Promoters (FPs), Farmer Field School Facilitators (FFs), Socio-Economic Development Officers (SEDOs) and District / Sector Agronomists from the three districts -- Gasabo, Kicukiro and Nyarugenge of Kigali city. Training workshops (28 January to 15 February) trained 211 intermediaries (29% females, 33% youth (<35years)) to understand and manage climate risk, and to facilitate the PICSA process with the farmers they serve. Topics included the PICSA process, field practice, knowledge sharing, planning for trainings to smallholder farmers, and use of seasonal forecasts. PICSA trainings for mentioned three districts concluded the PICSA trainings in Rwanda. These training activities marked the milestone of implementing climate services for farmers into all 30 of Rwanda's districts, through the *Twigire Muhinzi* agricultural extension system and the PICSA process.

Intermediaries discussing the seasonal calendar during PICSA training. Photo: S. Samuel

Meteo-Rwanda visit for trained intermediaries

Trained intermediaries from the Gasabo District had the opportunity to visit the Rwanda Meteorology Agency (Meteo-Rwanda) to learn how climate information is produced. They visited the forecasting room where the weather forecast is produced and the Park Meteo where they saw different ground stations that gather climate data, including the automatic weather station (Fig. 2). Meteo-Rwanda staff explained the process used to produce climate information and how the information is disseminated to users.

Communication of March-May Seasonal Forecast

In partnership with Meteo-Rwanda and RAB, a one-day workshop was organized in February 2019 to communicate the March-May 2019 seasonal forecast to local project partners (Caritas Butare, Caritas Kibungo, Caritas Kibuye and DERN) and 16 PASP cooperatives representatives from Gatsibo, Ngoma, Nyanza and Rubavu districts. The previous seasonal forecast (September-December 2018) was reviewed before Meteo-Rwanda shared local forecasts for the March-May 2019 period that included seasonal onset and cessation, total rainfall and length of the rainfed growing season. With the assistance of a technician from RAB, seasonal forecasts were linked to crop characteristics including days to maturity and water requirements to identify which crops are likely to grow well in the March-May 2019 season.

Participants committed to disseminate the forecast to their fellow farmers through various methods. Local project partners planned to share the forecast through meetings with their sites representatives, who will then share the information with district and sector agronomists, SEDOs, FFS and FPs in their specific districts. Through those intermediaries, the information reached more that 100,000 farmers. Cooperative representatives agreed to use weekly community meetings, known as *Inteko Z'Abaturage*, to share the seasonal forecast information with at least 3500 farmers from four districts (Gatsibo, Ngoma, Nyanza and Rubavu). Phone calls and messaging were also used to facilitate the forecast dissemination process.

Communicating climate information through Radio Huguka

During the reporting period, 16 radio magazines were produced, broadcast and rebroadcast on Radio Huguka through the "*Urubuto Ntera*" program – a 20-minute prerecorded educational show that is broadcast once a week. A total of 20 talk shows, which are 60 minutes-long, were produced and broadcast once every week. These talk shows focused on providing farmers with climate information related to disaster management, climate variability risks management, pest control, agriculture practices and other topics that can help them make informed decisions. A total of 42 news reports of three minutes each were produced and broadcast, and four documentaries that were produced are almost finalized.

Disseminating climate services for agriculture through Radio Listeners Clubs

In partnership with Radio Huguka, participatory and interactive talk shows were conducted with farmers trained in PICSA. These farmers are members of the 225 listeners' clubs that were created from 17 districts based on *Twigire Muhinzi* groups. At least three clubs participate in talk shows related to climate services and other agricultural advisory services every Monday and Wednesday with the support of Meteo Rwanda, RAB and other stakeholders through active listening, learning and feedback. Topics included the evaluation of September-December 2018 Season A seasonal forecast, and preparations and communication of the March-May 2019 Seasonal B forecast. At least 735 club members participated in talk shows, and 194 shared feedback through phone calls and 42 through SMSs. Feedback included requests for climate information at the cell level, involving farmers and other stakeholders in the process of climate risk management, more trainings on climate adaptation measures, and appreciation on seasonal forecast that helped in adjusting farmers' agriculture plans. In this quarter, 21 topics were discussed and RAB, Meteo Rwanda, Radio Huguka, Nkunganire Program, PASP and 13 district agronomists participated in these talk shows.

Mr. Wellars Kabalisa in PICSA experimental plot in Nyanza District

Table 1. Local project partner activities, January to March 2019.

Partner	PICSA refresher Training	Experimental trials	March-May 2019 seasonal forecast
Caritas Butare	PICSA refresher trainings conducted for 439 FPs from 8 districts in Southern Province	Follow up on maize harvesting from September-December 2018 and beans planting for March-May 2019 (Fig.3) for 27 experimental plots in Nyanza and Nyamagabe Districts	March-May 2019 seasonal forecast communicated to 94 District and Sector Agronomists and SEDOs from 8 districts, who later shared the information with their fellow farmers
Caritas Kibungo	PICSA training for 66 Farmer Promoters from Kayonza District and communication of climate services in JADF meetings, Kayonza District	Follow up on maize harvesting (September-December 2018) and beans planting (March-May 2019) for 8 experimental plots in Kirehe and Bugesera Districts	March-May 2019 seasonal forecast communication activities in Eastern Province
Caritas Kibuye	PICSA refresher trainings conducted for 49 intermediaries (Agronomists, SEDOs, FFS and FPs) from Western Province	Follow up on 30 field trials from Karongi and Nyamasheke Districts	March-May 2019 seasonal forecast communication for 170 Farmer Promoters from four districts, these FPs are representatives of 612 Twigire Muhinzi groups from Western Province
DERN	PICSA refresher trainings for 568 intermediaries from the Northern Province	Follow up on 30 field trials from 8 districts in the Northern Province	March-May 2019 seasonal forecast communication activities to 2367 Farmer Promoters representing of 119 Twigire Muhinzi groups in Northern Province

Outcome 2: Climate Services for Government and Institutions

Local government Maproom training and prototyping

A Climate Maproom training workshop (14-15 March) introduced District Agronomists to the features and potential applications of Meteo-Rwanda Maprooms, and elicited their input into the design of a simplified Summary Maproom that will provide local government offices with simplified access to several information products for their sector or district. This was a collaborative activity with the WISER-Rwanda project, which covered the training workshop and is leading engagement of local government; and RCSA, which developed a prototype and is leading development of the Maproom products with Meteo-Rwanda.

Soil nutrient scanner and advisories

As part of the process to help farmers improve their crop production using climate services linked with crop characteristics as per the PICSA approach, the RCSA project will leverage a digital soil scanner, recently purchased by CIAT through a complementary IFAD PASP project. This is a digital near-infrared scanner developed by Agro-Cares, coupled to a mobile app that converts soil analysis results into crop management recommendations. Soil analysis results and crop management recommendations are then immediately available to participating farmers.

Outcome 3: Climate Information Provision

Strengthening Meteo-Rwanda capacity

Meteo-Rwanda changed leadership during the reporting period. The project team interacted with the new Director to update him on project activities, and review remaining capacity gaps and a request from the previous Director for further capacity development – particularly related to the downscaled seasonal climate forecast system and maproom. Preparations by Meteo-Rwanda and IRI are underway for a 4-week Meteo-Rwanda staff visit to IRI, with the objectives of improving capacity to develop and maintain Maprooms independently; and understanding, managing and documenting the entire process of developing objective downscaled seasonal forecasts. The tentative plan is to hold the visit in June-July 2019.

Developing climate information products and tools

IRI worked to update the titles in English and Kinyarwanda for the PICSA graphs, generated by the Meteo-Rwanda Maprooms, for the training for the current March-May season. IRI received feedback from the PICSA training on what changes should be implemented in the Rwanda Maproom.

The team at IRI updated the seasonal forecast maproom to include the September-December 2018 season. They also developed a mock-up for a Sector-based Summary Maproom for local governments to visualize local conditions in one simplified maproom, to facilitate input from District Agronomists involved in the 14-15 March training workshop.

Outcome 4: Climate Services Governance

Engaging NFCS stakeholders at the Impact-Based Early Warning Service workshop

The project leveraged a workshop on Impact-Based Early Warning Service (Marasa Umubano Hotel, Kigali, 15-17 January), sponsored by the WISER-Rwanda project, to engage key participants from the initial Rwanda National Framework for Climate Services (NFCS) workshop, and raise awareness of subsequent progress in the development of the NFCS.

ICT tool to capture user feedback and support co-production

The project contributed to a new ICT-based monitoring and evaluation tool (5Qs) to promote two-way communication and co-production, by using recent PICSA trainings for intermediaries to test and refine the tool, and by contributing to a database of more than 100,000 farmers who are potential participants. A 5Qs question tree was tested separately with 211 intermediaries (FPs, FFS, SEDOs and Agronomists) from Kigali who were undergoing PICSA training, and 30 agronomists from all districts who were attending the Rwanda Climate Maproom training. The tool, which is being implemented by the WISER-Rwanda project to support efficient co-production of climate service, is discussed further under Coordination with Other USAID Programs and Partner Initiatives.

Capacity Building

Capacity building for AIMS students

In this this quarter, under the MoU between CIAT and the African Institute for Mathematical Sciences (AIMS), all ten AIMS students have completed their internship at CIAT. They have submitted their research reports and draft papers on their research topics.

South-South exchange with CIAT South-Asia staff and partners

With support from the CIAT-led De-Risk project in Southeast Asia, Gloriose Nsengiyumva (RCSA Outcome 1 Coordinator) spent a month (16 February to 17 March) in Hanoi, Vietnam to share the project's approach, provide training in the PICSA methodology, and exchange experience and lessons between regions. This training was organized for De-Risk project staff and its partner countries (Myanmar, Cambodia and Vietnam).

Project Outputs

Climate information and tools

- Updated seasonal forecast maproom

Publications and presentations

- Siebert, Asher, Tufa Dinku, Floribert Vuguziga, Anthony Twahirwa, Desire M. Kagabo, John delCorral, and Andrew W. Robertson (2019). Evaluation of ENACTS-Rwanda: A new multi-decade, high-resolution rainfall and temperature data set—Climatology. *International Journal of Climatology*.
- Hansen, J., Vaughan, C., Dinku, T., Kagabo, D.M., Carr, E., Korner, J., Zougmoré, R. (2019). Climate services can support African farmers' context-specific adaptation needs at scale. *Frontiers in Sustainable Food Systems*.

Communications and engagement

- News updates and blog stories were promoted on the social media of the RCSA (@RwandaCSA), CCAFS East Africa (@cgiarclimate_EA) and CCAFS PMU (@CGIARclimate).
- February 2019 marked the dissemination of PICSA trainings across all of Rwanda's districts. This is a first in scale for the PICSA process which had previously never covered an entire country. This achievement was promoted on RCSA and CCAFS East Africa Twitter, CCAFS PMU (Twitter, LinkedIn and Facebook) and cross-posted by partners, CCAFS website and CCAFS East Africa quarterly newsletter. https://twitter.com/cgiarclimate_EA/status/1108748456049426432 https://twitter.com/CGIARclimate/status/1108693508507004928
- New partnerships launched to bolster climate services in Rwanda (blog)
- Trainings in climate services for agriculture reach all of Rwanda (blog)
- Putting seasonal forecasts in the hands of Rwandan farmers (blog)

- Africa Environment Day: CCAFS highlights efforts to bridge the agricultural gender gap in Ethiopia, Mali, Rwanda and Senegal (blog)
- Photographs from visit of Seble Samuel to Kigali (Flickr)
- RCSA Project Newsletter: 100 copies were printed for dissemination to project partners, farmer cooperatives, and other stakeholders. Copies will also be distributed in relevant national, regional and international fora.
- East Africa Regional CCAFS Newsletter: All RCSA project stories have been featured in the January – March 2019 CCAFS East Africa quarterly newsletter that was sent to 599 recipients.

Project Management and Administration

Planning for End-line survey

A planning meeting was held in February 2019 during the CCAFS meetings in Nairobi. The meeting was attended by Brian Chiputwa (ICRAF), Phillip Thornton, Jim Hansen (remote), Desire Kagabo, Maren Radeny and Gloriose Nsengiyumva to discuss the final evaluation strategy. The design of the end-line survey tool is in an advanced stage and will be shared with CIAT for comments.

ICRAF is working to finalize the sampling process with input from the RCSA team but because of a general lack of overlap between the baseline survey 2016 and the midterm surveys of 2017, a decision was made that the end-line survey will follow up on the 584 sample from the CISRI-co-funded midterm evaluation survey. The end-line survey will evaluate the effectiveness of the PICSA program in terms of its reach and impacts on smallholder farmers in Rwanda. We will compare the outcomes of trained PICSA sectors vs. non-trained sectors. We will also assess the subjective assessment of the PICSA trainings as perceived by trained farmers. Budget permitting, the intention is to follow up with each household that was interviewed in the midterm review and interview both the male and female members of the household. This will enable the project to capture the gender disaggregated effects of the PICSA project.

National Climate Outlook Forum (NCOF)

The RCSA project team participated in the NCOF meeting that was organized by the Meteo-Rwanda held on 19 February 2019 at Marasa Umubano Hotel.

RCSA project database

In this quarter, a database for RCSA beneficiaries was created and data are being collected in partnership with project' local partners. PICSA trained champions (FPs) socio economic information were recorded. Starting with the survey, a template of data entry for PICSA champions and facilitators was developed to be automatically filled with data from ODK application in tablets and mobile phones being used by enumerators. These activities are ongoing and the database will be shared once completed.

As the collection of socio-economic data will be done using ODK application, its forms and web retrieval were created and connected on the server. In addition, data that were collected in different research activities were gathered in the project database. The database includes: farmers trained in PICSA, data

collected by M.Sc. students and AIMS interns during their project research activities, data on soil, data on PICSA experimental trials, monitoring and evaluation survey data, and baseline survey data.

Communications

On 4-9 February 4-9, Seble Samuel, CCAFS East Africa Communications and Knowledge Management Officer, travelled to Kigali to document the final round of trainings in PICSA. This included social media, photography, interviews with farmers and project partners, and a team meeting on communications deliverables for 2019, including all CCAFS website content, documentary support, social media, a project photo story, and infographic of climate-smart practices.

Coordination with Other USAID Programs and Partner Initiatives

The visit of Gloriose Nsengiyumva to Hanoi was funded by the De-Risk project, which receives its funding from the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. The visit a valuable opportunity to share knowledge, approaches and experience between agricultural climate service researchers and implementers in East Africa and Southeast Asia.

Several activities involved synergies with the WISER Enhancing Climate Information Services for Agriculture and Disaster Risk Reduction in Rwanda project, funded by the UK Department for International Development (DFID) through the UK Met Office:

- The WISER project sponsored the Climate Maproom training workshop for District Agronomists (14-15 March), while the RCSA project contributed to the development of the draft Maproom user manual and design of the climate summary Maproom for local government.
- The RCSA project contributed to a new ICT-based monitoring and evaluation tool to promote two-way communication and co-production, by using recent PICSA training for intermediaries to test and refine the tool. The 5-Question (5Q) tool, being developed as part of the WISER project, uses a sequence of 5 simple yes/no or multiple-choice questions, within a decision tree structure, to capture and record context-specific feedback from farmers or other stakeholders. The 5Q tool, with its simple mobile phone interface and automated process, is a step towards overcoming the practical challenge of efficiently bringing diverse users' voice into the co-production of climate services at a national scale. A database of potential recipients (more than 100,000 farmers) of the 5Q has been created – also leveraging PICSA implementation under the RCSA project.
- The WISER project organized an Impact-Based Early Warning Service (IBEWS) workshop (Marasa Umubano Hotel, Kigali, 15-17 January) to introduce the concept and project plans to Meteo-Rwanda and key partner organizations, with a focus on disaster management and agriculture. RCSA leveraged the workshop to engage key participants in the initial Rwanda National Framework for Climate Services (NFCS) workshop, and raise awareness of subsequent progress in the development of the NFCS.

The RCSA project is contributing to the development of streamlined soil fertility management advisories to complement climate-based advisories, leveraging a soil nutrient scanner purchased by the IFAD-funded Post-Harvest and Agribusiness Support Project (PASP).

RCSA team members participated in a GHACOF51 side event, "How can climate science support food security and nutrition interventions?," co-organized by CCAFS, ICPAC and the WISER program (through UK Met Office).

Planned Activities for the Next Reporting Period

Outcome 1. Climate services for Farmers

- PICSA roll out by farmers promoters in three districts of Kigali city (Gasabo, Kicukiro and Nyarugenge).
- Talk shows, debates, live shows about climate services will be conducted through our partner communication company (Radio Huguka).
- Follow up on listeners clubs' activities via Radio Huguka.
- Follow up on PCSA experimental trials.
- Socio economic data collection on project beneficiaries.

Outcome 2. Climate services for Government and Institutions

- Validation workshop for soil water holding capacity map.

Outcome 3: Climate Information Provision

- Planning for the training of Meteo-Rwanda staff at IRI. Training will likely be held in June 2019
- Remote support to Meteo-Rwanda to produce next season's forecast.
- Implement the changes to the Rwanda maproom that were recommended by Meteo-Rwanda after the PICSA training. These will include more translation of maproom content to Kinyarwanda.
- Develop the Summary Maproom for local government, for all sectors.
- Monitor availability and usage of the maproom and assist with any system problems.
- Research for development of within-season monitoring products from the soil water balance. Meteo-Rwanda's monitoring gridded data is currently available only on a 10-daily time step therefore this might require additional steps to be able to develop such products.
- Continue to work on "Evaluation of ENACTS-Rwanda: A New Multi- Decade, High- Resolution Rainfall and Temperature Dataset: Part II Variability and Trends."

Outcome 4. Climate Services Governance

- Meetings with institutions to be involved in the National Framework for Climate Services (NFCS).